

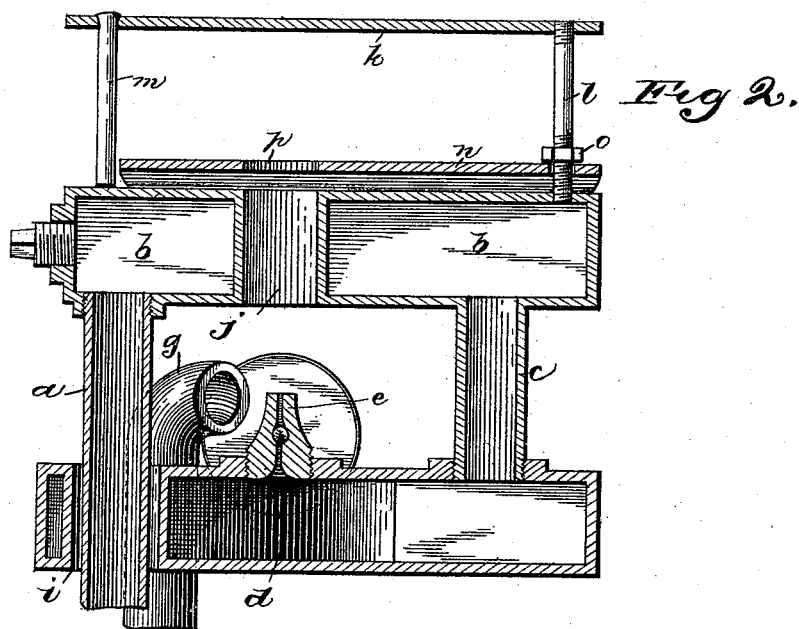
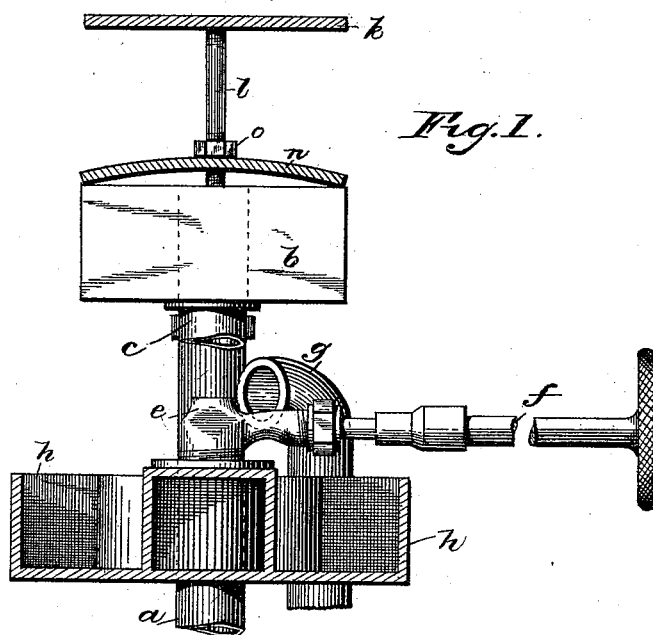
(No Model.)

2 Sheets—Sheet 1.

G. LITTLEFIELD.
VAPOR GENERATING BURNER.

No. 493,171.

Patented Mar. 7, 1893.



Witnesses

A. C. Cushman.
C. M. Sweeney

Inventor

George Littlefield
By Machos Calver & Randall

Attorneys

(No Model.)

2 Sheets—Sheet 2.

G. LITTLEFIELD.
VAPOR GENERATING BURNER.

No. 493,171.

Patented Mar. 7, 1893.

Fig. 3.

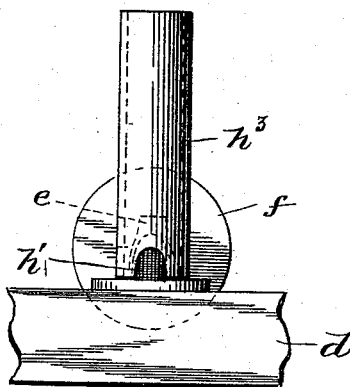
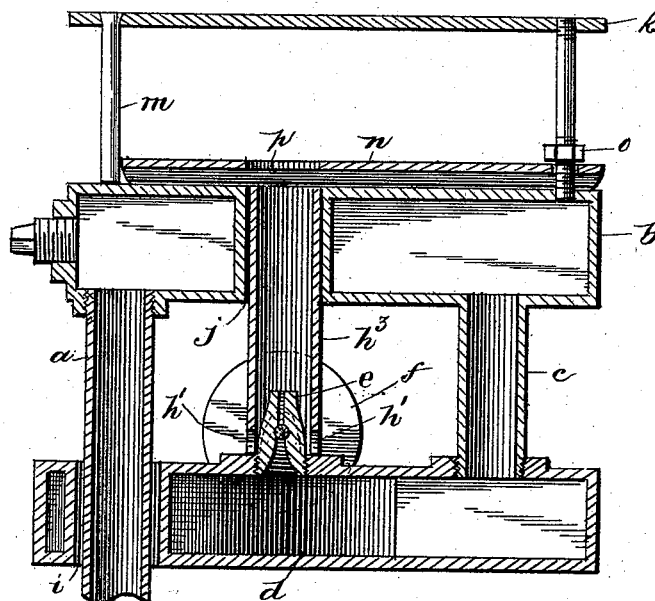


Fig. 4.

Witnesses
O. R. Cushman
C. M. Sweeney

Inventor
George Littlefield
By Macleod Balver & Randall
Attorneys

UNITED STATES PATENT OFFICE.

GEORGE LITTLEFIELD, OF BURLINGTON, WISCONSIN.

VAPOR-GENERATING BURNER.

SPECIFICATION forming part of Letters Patent No. 493,171, dated March 7, 1893.

Application filed February 8, 1892. Serial No. 420,678. (No model.)

To all whom it may concern:

Be it known that I, GEORGE LITTLEFIELD, a citizen of the United States, residing at Burlington, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in Vapor-Generating Burners, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has for its object to provide a vapor-generating burner of improved construction, which, when in use and being properly fed with crude petroleum or other liquid hydrocarbon, not only shall provide effectually for the generation of the vapor required to be supplied to the burner jet or jets, but shall be less liable to have the generating chamber thereof become overheated than other vapor-generating burners with which I have heretofore been acquainted. Such overheating is objectionable on account of its tendency to cause the burner to blow, and the generating chamber to become incrustated.

To this end, my invention consists mainly in a vapor-generating burner which is provided with a flame and heat arrester or spreader located above the generating chamber thereof, to arrest the ascent of the flame and heat rising from the point of ignition and cause it to act against the top of the generating chamber, and in a swinging or movable shield which may be interposed between the arrester or spreader and the top of the generating chamber when desired, in order to moderate the heat acting upon the top of the generating chamber, and which may be removed from such position when necessary, such removal being effected, for instance, when the burner is first lighted, at which time as much heat as can be obtained from the burner is desired for the purpose of warming up the generating chamber, all as will be described with reference to the accompanying drawings and then particularly pointed out in the claims at the close of this specification.

In the drawings, Figure 1 is a view in end elevation of a vapor-generating burner embodying my invention, portions thereof being represented in section in order to show the entire construction more clearly; Fig. 2 is a view in longitudinal section of the burner

represented in Fig. 1. Fig. 3 is a longitudinal section of a burner such as that represented in Fig. 1, this figure showing a vertical tube or pipe surrounding the burner jet. Fig. 4 is a view in detail of parts shown in Fig. 3.

Having reference to Figs. 1 and 2, *a* indicates the feed pipe for conveying crude petroleum or other liquid hydrocarbon from a supply-tank (not shown) to the generating chamber *b*, which latter has an area in cross-section considerably greater than that of the feed-pipe. A connecting pipe *c*, preferably cast in one with the generating-chamber, leads from the generating-chamber *b* downward to the vapor-chamber *d*, this latter being below the generating-chamber and provided with one or more burner-jets *e*. Each burner-jet *e* is provided with a valve *f* of suitable known character to regulate the jet of vapor which feeds the flame. Surrounding the vapor-chamber *d* is the primary generating-pan *h*. The flame of the burner-jet, if desired, may be supplied with air by a pipe *g*, which is shown in Figs. 1 and 2, the upper end of this pipe terminating adjacent to the burner-jet. This pipe extends through the generating-pan and through the bottom of a stove inclosing the burner to a cold air space near the floor, and the heat at the burner jet causes a draft which draws the cold air into the flame, thereby feeding fresh oxygen and greatly increasing the volume of heat generated. The feed-pipe *a* passes through a tubular passage-way *i* formed in the vapor-chamber *d*. The burner-jet *e* is located beneath the generating-chamber *b*, and the flame thereof rises through a passage-way or draft-hole *j* formed through the said generating chamber. Over the generating-chamber, and at a suitable distance above the same, is placed the arrester and spreader *k*. This device is supported above the generating-chamber by a post *l*, this post, for instance, having its ends screw-threaded as shown, and entered into screw-threaded openings in the arrester or spreader and the top of the generating-chamber. This post *l* is located, in the construction shown, at one end of the arrester and spreader and generating-chamber, and to the opposite end of the arrester and spreader is fixed a pin *m*, the lower

end of which rests upon the top surface of the generating-chamber. When desired for any purpose, the arrester and spreader may be swung laterally away from over the vapor-generating chamber. The flame and heat ascending from the burner-jet pass upward through the passage-way or draft-hole *j* and strike against the under side of the arrester and spreader *k*, by which they are arrested and spread or deflected horizontally. This arrangement causes the generating chamber to become heated from above, the heat acting mainly upon the top of the generating-chamber, and with less intensity and effect than if the ascending flame and heat were permitted to act directly upon the bottom of the generating-chamber.

For use in cutting off a portion of the heat from the top of the generating-chamber after the burner has begun to generate vapor properly, a movable shield *n* is provided. This shield is mounted in a position which permits it to be moved or swung over the top of the generating-chamber, and between the same and the arrester and spreader *k*, whenever it is desired to prevent overheating of the generating-chamber, and to be moved or swung aside whenever it is desired to permit the said chamber to receive the full effect of the heat, as when starting the burner. I have herein represented the shield *n* as pivoted on the post *l*, and as being held in position adjacent to the top of the generating-chamber *b* by a nut *o* which is threaded on the said post. The shield *n* is of proper form and size to cover the top of the generating-chamber *b*, and is slightly separated therefrom, preferably by being slightly curved transversely as shown in Fig. 1. The said shield is of proper size to cover the entire top of the generating-chamber, or substantially so, and in consequence of being curved as shown an air-chamber is formed between it and the top of the generating-chamber. Through this shield is formed a draft-hole *p* which, when the shield is swung into position over the generating-chamber, is in line with and vertically above the draft-hole *j* formed through the generating chamber.

When desired, I may apply to the burner a short tube or pipe *h*³, shown in Figs. 3 and 4, placing the same in such position that its lower end surrounds the burner-jet *e*, its upper end extending preferably up into the draft-hole *j*, whereby it is held in place and steadied. The lower end of the pipe *h*³ is formed with openings to admit air to the flame. When this pipe is combined with the burner-jet a form of Bunsen burner is produced. For the sake of clearness the pipe *h*³ is omitted from Figs. 1 and 2. The said pipe directs the flame properly and prevents currents or gusts of air from interfering therewith.

In using my improved vapor-generating burner the shield *n* is first swung or moved

away from over the generating-chamber. The oil, when first turned on, passes from the feed pipe *a* into the generating-chamber *b*, and then down through pipe *c* to the vapor-chamber *d*, whence a small quantity escapes through the burner-jet or burner-jets into the primary generating-pan *h*. On being ignited, the oil in the said pan soon makes sufficient heat to vaporize the oil in the generating-chamber, and thereafter the vapor is burned as it issues from the burner-jet. The flame from the burner-jet passes upward through the draft-hole *j* in the generating chamber and strikes against the arrester and spreader *k*, by which it is arrested and spread horizontally. The heat is thereby caused to act mainly against the top of the generating chamber. When the latter has become heated to the proper point the shield is swung or moved into position between the arrester and spreader and the generating-chamber, in order to prevent over-heating of the generating-chamber. By employing an arrester and spreader which is placed above the generating-chamber, the heat from the burner-jets acts with less intensity than it does when the heat is permitted to rise against the bottom of the generating-chamber, and by employing a movable or swinging shield capable of being interposed between the said arrester and spreader and the top of the generating-chamber, the effect of the heat can be controlled and modified, and overheating and its undesirable effects can be effectually avoided.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. A vapor-generating burner having a vapor-generating chamber, a burner-jet, an arrester and spreader located above the vapor-generating chamber and adapted to arrest and spread or deflect the ascending heat and flame horizontally and cause the heat to strike downwardly against the top of the chamber, and a movable shield adapted to be moved when desired between the top of the chamber and the arrester and spreader, substantially as and for the purposes set forth.

2. A vapor-generating burner provided with a vapor-generating chamber having a draft-hole *j*, a burner-jet located beneath said draft-hole, an arrester and spreader located above the vapor-generating chamber and adapted to spread or deflect the flame horizontally and cause the heat to strike downwardly against the top of the chamber, and a movable shield adapted to be moved when desired between the top of the chamber and the arrester and spreader, and formed with a draft-hole *p*, substantially as and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE LITTLEFIELD.

Witnesses:

F. RENSCHLEIN,
A. F. RANSOM.